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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LEE, SHUN K

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 11/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/800,366

Applicant(s)

WOOD, ROLAND A.

Examiner

Shun Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2002 & 23 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The papers filed on 3 September 2002 (certificate of mailing dated 28 August 2002) have not been made part of the permanent records of the United States Patent and Trademark Office (Office) for this application (37 CFR 1.52(a)) because of damage from the United States Postal Service irradiation process. The above-identified papers, however, were not so damaged as to preclude the USPTO from making a legible copy of such papers. Therefore, the Office has made a copy of these papers, substituted them for the originals in the file, and stamped that copy:

COPY OF PAPERS
ORIGINALLY FILED

If applicant wants to review the accuracy of the Office's copy of such papers, applicant may either inspect the application (37 CFR 1.14(d)) or may request a copy of the Office's records of such papers (*i.e.*, a copy of the copy made by the Office) from the Office of Public Records for the fee specified in 37 CFR 1.19(b)(4). Please do **not** call the Technology Center's Customer Service Center to inquiry about the completeness or accuracy of Office's copy of the above-identified papers, as the Technology Center's Customer Service Center will **not** be able to provide this service.

If applicant does not consider the Office's copy of such papers to be accurate, applicant must provide a copy of the above-identified papers (except for any U.S. or foreign patent documents submitted with the above-identified papers) with a statement that such copy is a complete and accurate copy of the originally submitted documents.

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If applicant provides such a copy of the above-identified papers and statement within **THREE MONTHS** of the mail date of this Office action, the Office will add the original mailroom date and use the copy provided by applicant as the permanent Office record of the above-identified papers in place of the copy made by the Office. Otherwise, the Office's copy will be used as the permanent Office record of the above-identified papers (*i.e.*, the Office will use the copy of the above-identified papers made by the Office for examination and all other purposes). This three-month period is not extendable.

Specification

2. The amendment filed 3 September 2002 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

- (a) amendments to the paragraph beginning on pg. 2, line 26 (*e.g.*, ... signal level ..., ... dynamic range ..., etc.);
- (b) amendments to the paragraph beginning on pg. 3, line 7 (*e.g.*, ... minimum infrared signal ..., etc.);
- (c) amendments to the two paragraphs beginning on pg. 3, line 18 (*e.g.*, ... dynamic range ..., ... NEP and NETD values ..., etc.);
- (d) amendments to the paragraph beginning on pg. 7, line 15 (*e.g.*, ... dynamic range ..., etc.);
- (e) amendments to the paragraph beginning on pg. 8, line 1 (*e.g.*, deletion of "shorter-duration", replacing "two" with --one--, etc.);

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- (f) amendments to the paragraph beginning on pg. 8, line 8 (e.g., replacing "'N' fast scanning", deletion of "longer", deletion of " ... fast scanning ... ", etc.);
- (g) amendments to the paragraph beginning on pg. 8, line 14 (e.g., ... factor of N ..., etc.);
- (h) amendments to the paragraph beginning on pg. 8, line 21 (e.g., ... higher performance ..., etc.);
- (i) amendments to the paragraph beginning on pg. 11, line 13 (e.g., deletion of ... individually controlled ... and ... coarse non-uniformity correction ..., etc.);
- (j) amendments to the paragraph beginning on pg. 11, line 17 (e.g., ... uniform output signal ..., etc.); and
- (k) amendments to the paragraph beginning on pg. 17, line 6 (e.g., ... current ..., ... noise equivalent power and noise equivalent temperature difference ..., etc.).

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Objections

3. Claims 10, 15, and 34 are objected to because of the following informalities:
 - (a) in claim 10, "the resulting signals" on line 1 should probably be --the two or more resulting signals--;
 - (b) in claim 10, "two or more bias current signals" on line 2 should probably be --two or more current signals--;
 - (c) in claim 15, "the output signal value" on line 2 should probably be --the output signal--;

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(d) in claim 17, "the digital image" on line 1 should probably be --the digital image processor--; and

(e) in claim 34, "the two or more pulses" on line 1 should probably be --the two or more bias pulses--.

Appropriate correction is required.

4. Claim 16 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 14 recites the limitation of an output circuit coupled to the computing circuit which is coupled to the measuring circuit. However, claim 16 (depending from claim 14) recites the limitation of the measuring circuit further comprising a digital image processor, coupled to the output circuit to receive the digital signal value which fails to further limit the subject matter of a previous claim.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 15-19 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 15 has been amended to recite the limitation of "the output circuit further comprises an integrator and an A/D converter to convert the output signal value to a digital signal values". The specification discloses a measuring circuit (pg. 11, lines 17-21) comprising an integrator and an A/D converter (pg. 6, lines 17-21; Fig. 3) and usage of the integrator to convert an output current to a signal voltage. The specification also discloses (pg. 11, line 23 to pg. 12, line 1) that a digital processor coupled to the measuring circuit which is used to compute an average signal value. However, the specification fails to describe how the integrator of the output circuit is used on the computed average signal value.

7. Claims 3-6, 16-19, and 28-32 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In regard to claims 3-6, the specification discloses (pg. 11, lines 15 and 16) that the signal circuit can apply corrective signals to produce coarse non-uniformity correction. Claim 3 has been amended to recite the limitation of "applying a corrective electrical signal to the output signal" wherein the output signal is based on computed average signal value which was not described in the specification.

In regard to claims 16-19, the specification discloses (Fig. 9 and claim 14) a measuring circuit 930 coupled to an array 110, a computing circuit 940 coupled to the measuring circuit 930, and an output circuit 950 coupled to the computing circuit 940. The specification further discloses (Fig. 9) that the output circuit (950) comprises an A/D

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converter. Thus the specification appears to disclose that all circuitry (*e.g.*, measuring circuit 930) upstream of the output circuit 950 comprises analog circuitry (*i.e.*, it is the A/D converter of the output circuit 950 which converts analog signals to digital signals). Thus, amended claim 16 (depending from claim 15) which recites the limitation of "the measuring circuit further comprising a digital image processor, coupled to the output circuit to receive the digital signal value" was not described in the specification as originally filed (see also objection to claim 16 above).

In regard to claims 28-32, the specification discloses (Fig. 9) that the output circuit (950) comprises an integrator and an A/D converter. The specification also discloses (pg. 11, lines 15 and 16) that the signal circuit (*i.e.*, measuring circuit 930 in Fig. 9) can apply corrective signals to produce coarse non-uniformity corrections. Thus, new claim 28 which recites the limitation of "the output circuit further comprising a correction circuit" was not described in the specification as originally filed.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 31 and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 31 which depends from claim 28 recites the limitation "a correction circuit" in line 2. However, claim 28 already recites the limitation "a correction circuit" in line 2. Thus claims 31 and 32 fails to particularly point out and distinctly claim the subject matter.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1, 2, 7, 9-14, 20, and 22-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Wood *et al.* (US 5,675,149) and incorporated by reference US Patent 5,420,419 (Wood).

It should be noted that frame time is the time in which a microbolometer produces a complete picture or image of an object being viewed (see lines 6 and 7 on pg. 2 of the specification).

In regard to claim 14, Wood *et al.* disclose an infrared radiation detector apparatus, comprising:

- (a) microbolometers in an array (column 5, line 65 to column 6, line 1);
- (b) a timing circuit coupled to the array to apply two or more bias pulses substantially sequentially (US 5,420,419 column 6, lines 18-34) to each of the microbolometers in the array during a frame time (*i.e.*, the exposure time for producing a complete image; column 5, lines 47-53);
- (c) a measuring circuit coupled to the array to measure two or more resulting signals associated with each of the applied two or more bias pulses (*i.e.*, multiple measurements; column 5, lines 47-53) during the frame time (*i.e.*, the exposure time);

- (d) a computing circuit coupled to the measuring circuit to compute an average signal value (*i.e.*, averaging of sensor signals; column 5, lines 47-53) for each of the microbolometers in the array from the measured two or more resulting signals during the frame time (*i.e.*, the exposure time); and
- (e) an output circuit coupled to the computing circuit to produce an output signal based on the computed average value for each of the microbolometer in the array during the frame time (*i.e.*, the exposure time) is inherent in the displaying an image corresponding to the output signals.

In regard to claim 1, the method steps are implicit for the apparatus of Wood *et al.* since the structure is the same as the applicant's apparatus of claim 14.

In regard to claim 2 which is dependent on claim 1, Wood *et al.* also disclose (column 1, lines 55-58) recording and displaying IR images. Inherent in the formation of images is repeating the applying, measuring, computing, and producing steps to compute output signals during each frame time in order to form an IR image.

In regard to claim 7 (which is dependent on claim 1) and claim 20 (which is dependent on claim 14), Wood *et al.* also disclose (US 5,420,419 Fig. 6 and column 6, lines 18-34) that the bias pulses are substantially equal in magnitude.

In regard to claim 9 (which is dependent on claim 1) and claim 22 (which is dependent on claim 14), Wood *et al.* also disclose (US 5,420,419 Fig. 6 and column 2, lines 17-20) that the two or more applied bias pulses comprise voltage bias pulses.

In regard to claim **10** (which is dependent on claim 1) and claim **23** (which is dependent on claim 22), Wood *et al.* also disclose (US 5,420,419 column 7, lines 26-28) that the resulting signals comprise current signals.

In regard to claim **11** (which is dependent on claim 1) and claim **24** (which is dependent on claim 14), Wood *et al.* also disclose (column 5, lines 47-53) that multiple measurements and averaging of sensor signals is equivalent to long exposures.

Inherent in an average is at least two sensor signals each associated with an applied bias pulses and thus there are in the range of about 2 to 100 bias pulses dependent on the length of the exposure.

In regard to claim **12** (which is dependent on claim 1) and claim **25** (which is dependent on claim 24), Wood *et al.* also disclose (US 5,420,419 Fig. 6 and column 6, lines 18-34) that the two or more bias pulses have time duration in the range of about 0.1 to 20 microseconds (e.g., 5-6 μ s).

In regard to claim **13** (which is dependent on claim 1) and claim **26** (which is dependent on claim 14), Wood *et al.* also disclose (column 5, lines 47-53) that multiple measurements and averaging of sensor signals is equivalent to long exposures. The exposure time (*i.e.*, frame time) is inherently the time it takes for the array to produce a complete image of an object being viewed by the array.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 8, 21, 27, and 33-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood *et al.* (US 5,675,149) and incorporated by reference US Patent 5,420,419 (Wood) in view of Duvall, III (US 5,258,619).

In regard to claim 8 (which is dependent on claim 1) and claim 21 (which is dependent on claim 20), the infrared radiation detector apparatus and method of Wood *et al.* lacks that the bias pulses are substantially equally spaced in time. Duvall, III teaches (column 6, lines 43-53) a swept bias technique includes adjusting the waveform parameters of rise-time, fall-time, peak to peak values, time between pulses, pulse slope, pulse width, and pulse amplitude that best meets a given detector and design situation in order to minimize unwanted detector heating. Therefore it would have been obvious to one having ordinary skill in the art to adjust the bias pulses waveform parameters (e.g., pulses are substantially equally spaced in time) in the infrared radiation detector apparatus and method of Wood *et al.*, in order to meet a given detector and design situation so as to minimize unwanted detector heating as taught by Duvall, III.

In regard to claim 27, Wood *et al.* is applied as in claim 14 above. The apparatus of Wood *et al.* lacks that the resulting temperature in each of the microbolometers in the array is substantially uniform. Duvall, III teaches (column 4, lines 43-53) a swept bias technique includes adjusting the waveform parameters of rise-time, fall-time, peak to peak values, time between pulses, pulse slope, pulse width, and pulse amplitude that best meets a given detector and design situation in order to minimize unwanted detector

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heating. Minimizing detector heating due to bias results in minimal change in detector temperature and thus the detector is at the substantially uniform initial temperature.

Therefore it would have been obvious to one having ordinary skill in the art to adjust the bias pulses waveform parameters (e.g., pulses are substantially equally spaced in time) in the infrared radiation detector apparatus and method of Wood *et al.*, in order to meet a given detector and design situation so as to minimize unwanted detector heating resulting substantially uniform temperature as taught by Duvall, III.

In regard to claim **33** which is dependent on claim 27, Wood *et al.* is applied as in claim 20 above.

In regard to claim **34** which is dependent on claim 27, Wood *et al.* in view of Duvall, III is applied as in claim 21 above.

In regard to claims **35** and **36** which are dependent on claim 27, Wood *et al.* is applied as in claims 22 and 23 above.

In regard to claims **37** and **38** which are dependent on claim 27, Wood *et al.* is applied as in claims 24 and 25 above.

In regard to claim **39** which is dependent on claim 27, Wood *et al.* is applied as in claim 26 above.

Response to Arguments

14. Applicant's arguments filed 3 September 2002 have been fully considered but they are not persuasive.

Applicant argues (pg. 17 of remarks filed 3 September 2002) that Wood *et al.* do not disclose applying two or more bias pulses during a frame time. Examiner

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respectfully disagrees. Wood *et al.* states (column 5, lines 47-53) that "If desired, slower slide velocities, or multiple scans of any desired region of the scene, can be employed to allow sensitivity improvement by multiple measurement and averaging of sensor signals: in this case, a stable platform for example, a tripod mounting of the camera may be required, analogous to long exposures of visible photographic still frame cameras". It should be noted that frame time is the time in which a microbolometer produces a complete picture or image of an object being viewed (see lines 6 and 7 on pg. 2 of the specification). Thus, Wood *et al.* disclose multiple measurements and averaging of sensor signals. The time needed to obtain these multiple measurements and of sensor signal averages so as to produce a complete picture or image is the frame time. Therefore, Wood *et al.* teaches applying two or more bias pulses substantially sequentially to each of the microbolometers in the array during a frame time.

In response to applicant's argument (pg. 18 of remarks filed 3 September 2002) that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e.*, the image defect is fine offsets or the image defect is dead pixels) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Applicant should note that amended claim 6 recites image defects selected from the group and amended claim 18 recites or.

In response to applicant's arguments (pg. 19 of remarks filed 3 September 2002) against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.

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See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (703) 308-4860. The examiner can normally be reached on Tuesday-Thursday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703) 308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

SL
November 19, 2002



DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800